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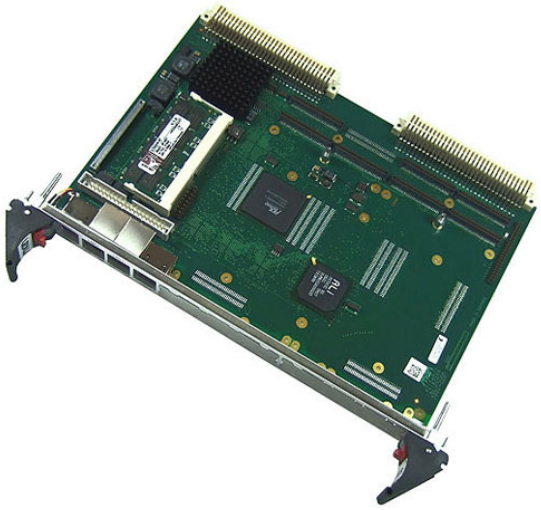
A15C - 6U VME64 MPC8245 CPU Board (PMC Modules)



- **PowerPC® MPC8245 / 400 MHz**
- **64-bit VMEbus master and slave**
- **512 MB DRAM, CompactFlash®**
- **Graphics via PMC**
- **Dual 10/100Mbit Fast Ethernet**
- **4 COMs, USB, IDE, keyboard/mouse**
- **2 PMC slots**
- **MENMON™ BIOS for PowerPC® cards**
- **-25 to +85°C screened**

The A15C is a PowerPC® MPC8245 based single-board computer for embedded applications. It features full VME64 support and it can be used as a master or a slave in a VMEbus environment. The A15C provides 1 MB local dual-ported SRAM for slave access and communication between the local CPU and another VMEbus master.
The CPU card comes with the MPC8245 PowerPC® with 400 MHz clock frequency and local 32-bit/33-MHz PCI data bus. It is a complete state-of-the-art SBC offering DRAM, Flash and CompactFlash® memory, dual Fast Ethernet, four COMs, USB, IDE and keyboard/mouse interfaces as well as an optional onboard hard disk.
In addition, the A15C can be equipped with PMC mezzanine cards supporting both front I/O and rear I/O. PMCs may particularly be used for intelligent telecom I/O. The modular combination of I/O functionality on a single-board computer allows to build up tailored control systems which appear as customized solutions based on standard components. Depending on the kind of I/O requirements, further standard versions of A15 are availabe for other mezzanine standards.
The A15 comes with MENMON™ support. This firmware/BIOS can be used for bootstrapping operating systems (from disk, Flash or network), for hardware testing, or for debugging applications without running any operating system.
The A15 single-board computer is partly compatible with the MVME2100 board by Motorola.

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Technical Data

CPU
- PowerPC®
  - MPC8245
  - 400 MHz
  - Double precision FPU

Memory
- L1 Cache integrated in MPC8245
- Up to 512 MB SDRAM system memory
  - One 144-pin SO-DIMM slot for SDRAM modules
  - 133 MHz memory bus frequency
- 2 MB Boot Flash
- 32 MB application Flash (optional)
  - 64-bit data bus
- Serial EEPROM 4 kbits for factory settings
- CompactFlash® card interface
  - Via onboard IDE
  - Type I
  - True IDE

Mass Storage
- Parallel IDE (PATA)
  - One port for local CompactFlash®
  - One port for local hard-disk drive
  - Drive can be connected via ribbon cable or mounted directly on the CPU board using MEN adapter kit
  - Only one VMEbus slot needed even with hard disk
  - IDE port also available for rear I/O, alternatively to onboard connector

I/O
- USB
  - One USB 1.1 port
  - Accessible via I/O connector J2
  - OHCI implementation
  - Data rates up to 12 Mbit/s
  - External PHY
- Ethernet
  - Two 10/100Base-T Ethernet channels
  - RJ45 connectors with two LEDs at front panel
- Two RS232 UARTs (COM1/COM2)
  - RJ45 connectors at front panel
  - Data rates up to 115.2 kbit/s
  - 16-byte transmit/receive buffer
  - Handshake lines: CTS, RTS; DCD, DSR, DTR
  - 16550 compliant
- Two UARTs (COM3/COM4)
  - Accessible via I/O connector
  - Data rates up to 115.2 kbit/s
  - 16-byte transmit/receive buffer
  - Handshake lines: none
  - 16550 compliant
- PS/2 keyboard/mouse
  - Accessible via I/O connector
  - Requires external PHY

Rear I/O
- PMC 0

Mezzanine Extensions
- Two PMC slots
  - Compliant with PMC standard IEEE 1386.1
  - Up to 64-bit/64-MHz, 3.3V V(I/O)
  - PMC I/O module (PIM) support through J4 (slot 0)

Miscellaneous
- Serial real-time clock with integrated 56-byte NVRAM
- Serial hardware watchdog in supervisory circuit
- Temperature sensor
- Hex switch for user settings
- User LEDs (integrated into COM1 connector)
- Reset button in ejector handle
- Abort button via I/O connector
- JTAG/BDM connector

Local PCI Bus
- 32-bit/33-MHz, 3.3V V(I/O)
- Compliant with PCI Specification 2.2

VMEbus
- Compliant with VME64 Specification
- Slot-1 function with auto-detection
- Master
  - D08(EO):D16:D32:D64:A16:A24:A32:ADO:BLT:RMW
- Slave
  - D08(EO):D16:D32:D64:A16:A24:A32:BLT:RMW
- 1 MB shared fast SRAM
- DMA
- Mailbox functionality
- Interrupter D08(O):I(7-1):ROAK
- Interrupt handler D08(O):IH(7-1)
- Single level 3 fair requester
- Single level 3 arbiter
- Bus timer
- Location Monitor
- Performance
  - Coupled read/write D32 non-block transfer rate 6.5 MB/s
  - DMA read/write D32 BLT transfer rate 12.1 MB/s
  - DMA read/write D64 MBLT transfer rate 25 MB/s

Electrical Specifications
- Supply voltage/power consumption:
  - +5 V (-3%/+5%), 1.3 A typ.
  - ±12 V (-5%/+5%), only used for mezzanines, tbd.
- MTBF: 126 000 h @ 40°C (derived from MIL-HDBK-217F)

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Technical Data

Mechanical Specifications

- Dimensions: standard double Eurocard, 233.3 mm x 160 mm
- Weight (without mezzanines and accessories): 330 g

Environmental Specifications

- Temperature range (operation):
  - -25..+85°C (screened)
  - Airflow: min. 10 m³/h
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- Altitude: -300 m to +3000 m
- Shock: 15 g, 11 ms
- Bump: 10 g, 16 ms
- Vibration (sinusoidal): 2 g, 10..150Hz
- Conformal coating on request

Safety

- PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

EMC

- Tested according to EN 55022 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst)

BIOS

- MENMON™

Software Support

- Linux
- VxWorks®
- OS-9®
- QNX®
- For more information on supported operating system versions and drivers see Software.

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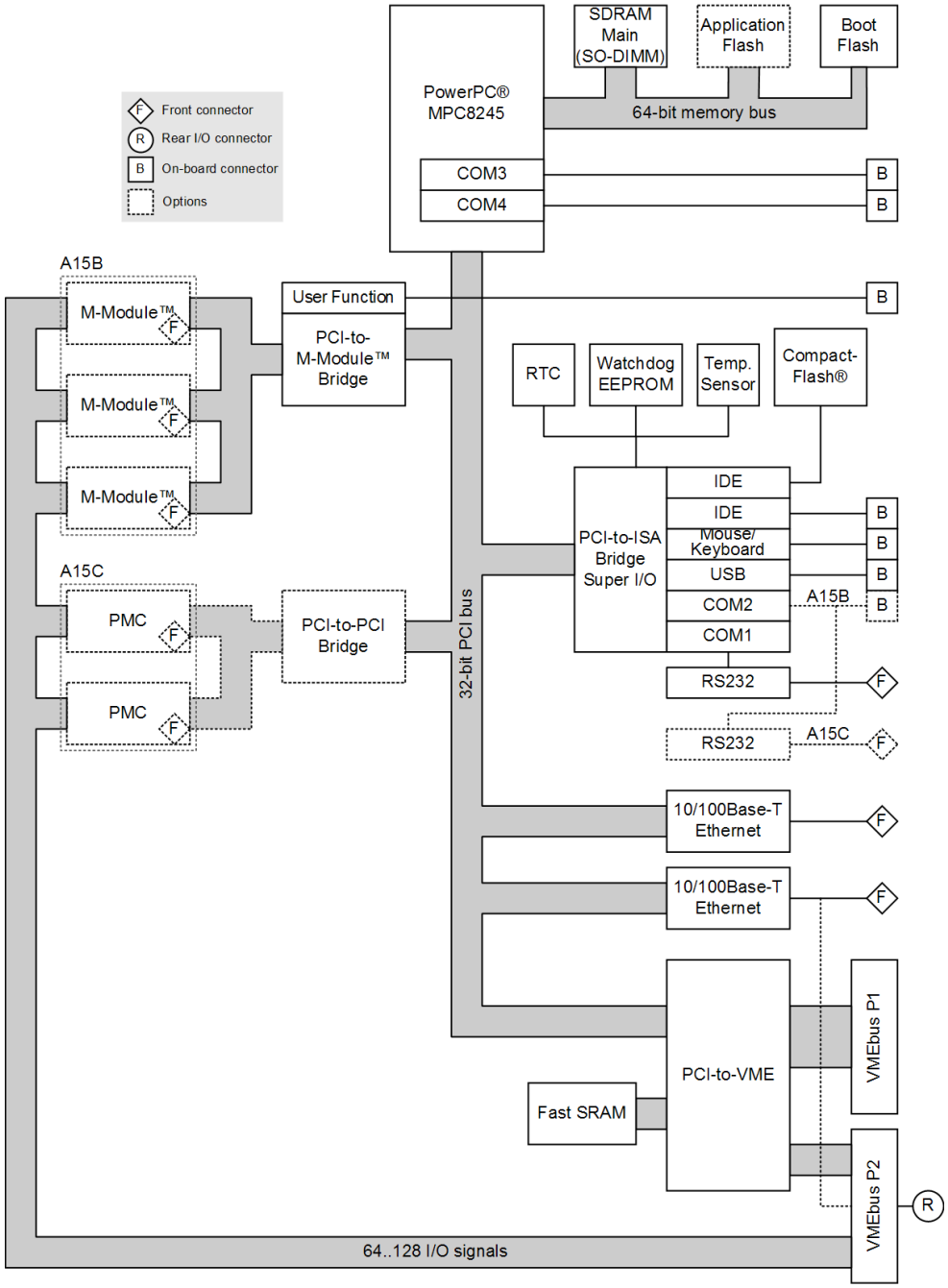
Diagram



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Configuration & Options

Standard Configurations

Article No.	CPU Type	Clock	System RAM	CFlash	Boot Flash	Mezzanine Slots	Operating Temperature
01A015B00	MPC8245	400 MHz	256 MB	0 MB	2 MB	3 M-Modules™	0..+60°C
01A015C02	MPC8245	400 MHz	512 MB	0 MB	2 MB	2 PMC	-25..+85°C

Options

CPU

- MPC8245, 400 MHz

Memory

- System RAM
  - 128 MB, 256 MB or 512 MB
- CompactFlash®
  - 0 MB up to maximum available
- Boot Flash
  - 2 MB
- Application Flash
  - 32 MB, 64-bit data bus

Mezzanine Slots

- 2 PMC
- 3 M-Modules™

Please note that some of these options may only be available for large volumes. Please ask our sales staff for more information.

Ordering Information

Standard A15C Models

01A015C02 MPC8245, 400MHz, 512MB SDRAM, 2MB Flash, 2 PMC slots, -25..+85°C screened

Related Hardware

01A015B00 MPC8245, 400MHz, 256 MB SDRAM, 2MB Flash, 3 M-Module™ slots, 0..+60°C

01A021C00 A21C, Freescale™ QorIQ™ single-core P1013, 800 MHz, 1 GB DDR3 ECC SDRAM, 32 MB Flash, 2 PMC/XMC slots, -40 to +85°C screened

Memory

0751-0042 CompactFlash® card, 4 GB, Type I, fixed bit set, -40..+85°C

0751-0053 CompactFlash® card, 2 GB, Type I, fixed bit set, -40..+85°C

0751-0055 CompactFlash® card, 8 GB, Type I, fixed bit set, -40..+85°C

0751-0058 CompactFlash® card, 16 GB, Type I, fixed bit set, -40..+85°C

SA-Adapters

You can find a more detailed overview of possible carrier board/SA-Adapter™ combinations along with software support in our option matrix (PDF).

08SA01-00 RS232, not optically isolated, 0..+60°C

08SA02-00 RS422/485, half duplex, optically isolated, 0..+60°C

08SA02-01 RS422/485, full duplex, optically isolated, 0..+60°C

08SA02-07 RS422/485, full duplex, optically isolated, -40..+85°C screened

08SA03-00 RS232, optically isolated, 0..+60°C

08SA03-01 RS232, optically isolated, -40..+85°C screened

Systems & Card Cages

MEN delivers turn-key systems completely installed (hardware, operating system, accessories), wired and tested. Different rack sizes, power supplies and backplanes on request.For details please contact your local sales representative.

Miscellaneous Accessories

05AD67-00 IDE mounting kit 44-pin to 44-pin; 50.8 mm; installation kit for Kahlua Box or A12, A15, D3 with AD67, temperature range: -40..+85°C

05A012-01 Mounting kit for 2 SA adapters for A12/A15/D3, incl. 6U 1-slot VME or CompactPCI® front panel incl. ribbon cable, without SA adapters

05F006-00 RS232 interface cable RJ45 to 9-pin D-Sub (1 COM to 1 COM), 2m

05M000-17 25 mounting screw sets to fix M-Modules™ on carrier boards

05P000-01 25 mounting screw sets to fix PMC/XMC modules on carrier boards

0710-0037 PATA hard disk drive 2.5", 24/7, 80GB, 4200rpm, -15..+70°C

08AD67-01 I/O extension 19" 6U 4HP incl. 1 USB connector, 1 keyboard connector, 1 mouse connector; prepared for 3 SA adapters, prepared for HDD 2.5", reset, abort, 0..+60°C

08AD71-00 AD71, 2.5" hard disk adapter for A13, A14, A15, D6, D7

Software: Linux

This product is designed to work under Linux. See below for potentially available separate software packages from MEN.

This product is designed to work under ELinOS Embedded Linux by Sysgo. For more information and product support please contact www.sysgo.com.

13Z014-90 Linux device driver (MEN) for PCI-to-VME bridge on A12, A13, A14, A15, A17, A19, A20 and B11

Software: VxWorks

This product is designed to work under VxWorks®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.

10F001N60 VxWorks® BSP (MEN) for A15, F1N, B11, A12, D3, SC13 and Kahlua Box

Software: QNX

This product is designed to work under QNX®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.

10F001N40 QNX® BSP (MEN) for F1N, B11, A12, A15, D3, SC13 and Kahlua Box

Software: OS-9

This product is designed to work under OS-9®. For details regarding supported/unsupported board functions please refer to the corresponding software data sheets.

Ordering Information

10F001N02	OS-9®(000) V4.2 BSP (object code, MEN) for F1N, B11, A12, A15, D3, SC13 and Kahlua Box

Software: Firmware/BIOS

MENMON™ is MEN's firmware/BIOS for PowerPC® platforms.

14A015-00	MENMON™ (Firmware) for A15 (object code)

Software: Miscellaneous

XiBase9, a graphical user interface from XiSys, is running on the MEN graphics controller PMC module P518 in combination with the PowerPC®-based single-board computer A15C running OS-9®. The necessary drivers are available on request, for more information please contact our sales staff.

For operating systems not mentioned here contact MEN sales.

Documentation

Compare Chart 6U VMEbus CPU and I/O cards Download

20AD67-00	AD67 User Manual
20A015-ER	A15 Errata
20A015-00	A15 User Manual
21APPN003	Application Note: Using P1/P501 Graphics on MEN 824x/ALI boards under ELinOS
21MENM-00	MENMON™ User Manual

For the most up-to-date ordering information and direct links to other data sheets and downloads, see the A15C online data sheet under » www.men.de.

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Contact Information

Germany
MEN Mikro Elektronik GmbH
Neuwieder Straße 3-7
90411 Nuremberg
Phone +49-911-99 33 5-0
Fax +49-911-99 33 5-901
E-mail info@men.de
www.men.de

France
MEN Mikro Elektronik SA
18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33 (0) 450-955-312
Fax +33 (0) 450-955-211
E-mail info@men-france.fr
www.men-france.fr

USA
MEN Micro, Inc.
24 North Main Street
Ambler, PA 19002
Phone (215) 542-9575
Fax (215) 542-9577
E-mail sales@menmicro.com
www.menmicro.com

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